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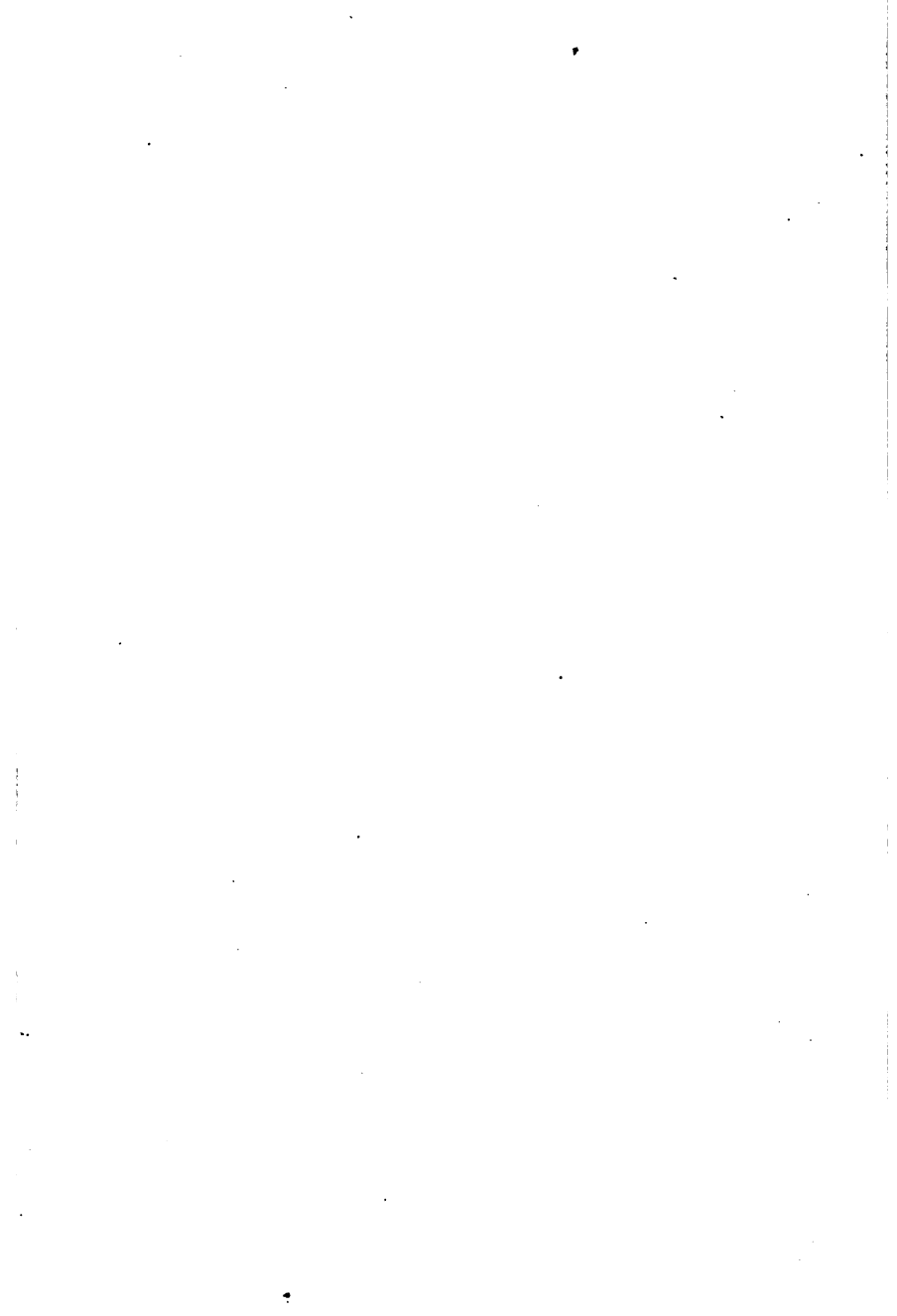
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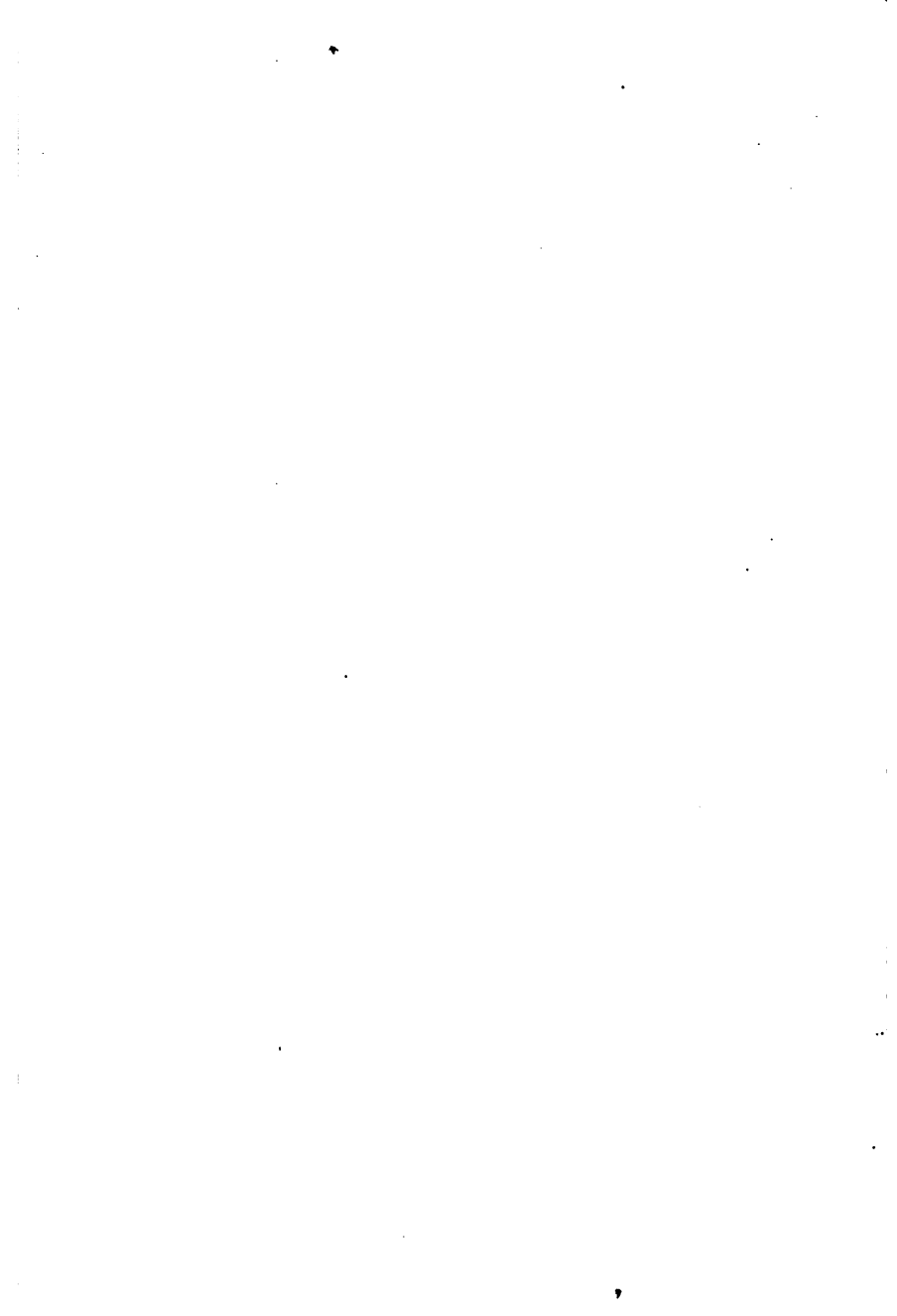


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**INDIVIDUALITY AND
IMMORTALITY**

The Ingersoll Lecture, 1906

INDIVIDUALITY AND IMMORTALITY

BY

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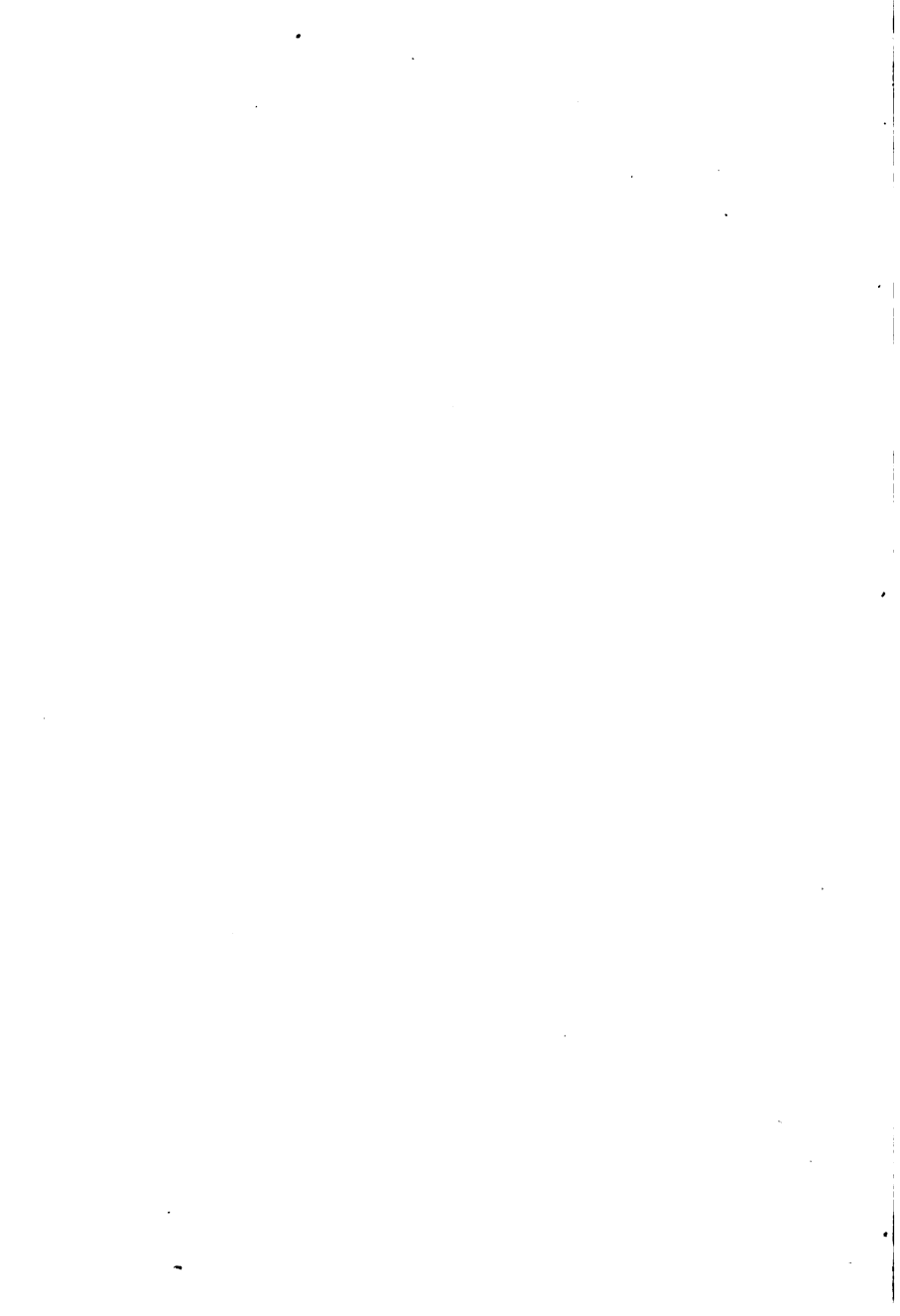
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THE INGERSOLL LECTURESHIP

*Extract from the will of Miss Caroline Haskell Ingersoll,
who died in Keene, County of Cheshire, New
Hampshire, Jan. 26, 1893.*

First. In carrying out the wishes of my late beloved father, George Goldthwait Ingersoll, as declared by him in his last will and testament, I give and bequeath to Harvard University in Cambridge, Mass., where my late father was graduated, and which he always held in love and honor, the sum of Five thousand dollars (\$5,000) as a fund for the establishment of a Lectureship on a plan somewhat similar to that of the Dudleian lecture, that is — one lecture to be delivered each year, on any convenient day between the last day of May and the first day of December, on this subject, "the Immortality of Man," said lecture not to form a part of the usual college course, nor to be delivered by any Professor or Tutor as part of his usual routine of instruction, though any such Professor or Tutor may be appointed to such service. The choice of said lecturer is not to be limited to any one religious denomination, nor to any one profession, but may be that of either clergyman or layman, the appointment to take place at least six months before the delivery of said lecture. The above sum to be safely invested and three fourths of the annual interest thereof to be paid to the lecturer for his services and the remaining fourth to be expended in the publication and gratuitous distribution of the lecture, a copy of which is always to be furnished by the lecturer for such purpose. The same lecture to be named and known as "the Ingersoll lecture on the Immortality of Man."



INDIVIDUALITY AND IMMORTALITY

WHEN the great and unexpected honor of being invited to deliver the Ingersoll Lecture on Immortality came to me, my feelings were of a rather complex nature. First of all, I felt of course proud, and thankful that I was to be intrusted with such a responsible task. Secondly, I felt a deep respect, not only for the men who did me the honor to invite me, but also for the institution under whose auspices the lecture is delivered. For as a general thing, a scientist, whose task it is to analyze the facts of experience irrespective of

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any preconceived ideas, will not find his results in accordance with ideas which are handed down from generation to generation — ideas which have become venerable, not only because of their age, but also because of the influence which they have had upon the development of mankind. There is a certain danger, not only in the occurrence of such possible differences, but also in the mere fact that the scientist applies his trenchant and merciless tools of investigation to subjects which interest us because of their practical bearing, and are at the same time dear to our hearts and closely connected with our deepest and most earnest feelings.

The fact that such considerations did not prevent the invitation shows

once more how deeply the modern man is persuaded of the ultimate wholesomeness of truth. No matter where an unprejudiced search after truth may lead an investigator; if his work is that of an honest scientist it must and will finally turn out to be for the benefit of mankind. Our knowledge is an incomplete piece of patchwork; but each one of us is bound to make the best possible use of the incomplete knowledge he possesses, conscious always that his results are any day liable to be replaced by new discoveries or ideas. So the authorities in charge of the Ingersoll Lecture thought it right, if I understand them correctly, that the subject should be investigated from every possible point of view, being sure that this is the

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only way that can bring us nearer and nearer to the ultimate truth.

If a chemist or physicist of to-day is asked about his ideas on immortality, his first feeling will be that of some astonishment. He meets with no question in his work which is connected with this one, and his reply may usually be classified under one of two heads. He may remember the religious impressions which have clung to him since his youth, kept alive by him or nearly forgotten, as the case may be, and he will then explain that such questions are in no way connected with his science; for the objects treated by his science are non-living matter. This is immediately evident in physics, and while there exists an *organic* chemistry, he will explain that any matter which

is called organic in his sense is decidedly dead before it can become the object of his investigation. It is only the inanimate part of the world which concerns him scientifically, and any ideas he may hold about the question of immortality are his private opinions and quite independent of his science. Or he may dismiss his interlocutor still more shortly by saying from his standpoint of matter-and-motion: Soul is a function of living matter only. The moment life ceases in an organized body the value of this function becomes zero, and there is no further question about immortality.

The very fact that I am standing before you at this moment, ready to deliver the Ingersoll Lecture, shows

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that in my opinion there is something more to be said about this question than is contained in these two answers. I do not intend to follow the line of the first answer and to explain in an apologetic way that, while physical science has nothing to say about immortality, neither does it shut out any of the perspectives that are possible, and that a man is left free to think or to believe anything which is brought home to him by special considerations. That this standpoint is a practicable one is proven by the fact that even so great a scientist as Michael Faraday maintained it through his long and incomparably fruitful career.

It will be necessary to investigate the other standpoint mentioned with much greater minuteness than that

reached by giving the brief, characteristic reply. It must be restated from its very foundation, because, as I have been maintaining for the last ten years, the matter-and-motion theory (or scientific materialism) has outgrown itself and must be replaced by another theory, to which the name *Energetics* has been given. The question therefore takes the form, What has energetics to say about immortality?

If we ask, Upon what property does the difference between man and even the highest of the lower animals depend? we get a most varied set of answers from different people. But when all considerations other than purely empirical ones are put aside, we find this difference dependent on the *different development of memory*.

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Memory is the indispensable prerequisite for learning, and man's culture rises so much higher than that of any animal simply because his memory is by far the best. Memory helps man in knowing how to act when dangers approach or wants are to be satisfied. By memory he learns to distinguish between good and evil. Memory helps him not only to look into the past, which can no longer be changed at will, but also to look into the future, which may be changed to his advantage. For if he knows how things happen he can foresee the later part of an event of which only an earlier part has been observed. The series of consecutive events which he can survey at any given time may be a short or a long one, and his power of prediction

will be small or great accordingly; but in every case he can act as a prophet, though perhaps not always a very powerful one.

Memory in the broadest sense is found even in the lowest forms of animal life, and in fact in all organic life. As Hering pointed out a long time ago, memory is a universal function of all living matter, if the meaning of the word be extended to its proper generality. The possession of memory means, then, that all living matter is so changed, by any process which goes on in it, that a repetition of the same process becomes easier, or occurs sooner, or takes place more quickly, than any other process. What the cause of this property may be we do not know, and the construction of any

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example or analogy from a physical-chemical standpoint is not an easy thing to do. There is no reason why this should not be done, however, and it seems possible that we may some day find out the very means which nature uses in the formation of memory. This part of the question, however, does not directly concern us in the present investigation.

It is wonderful how the consideration of this property enables us to understand certain very general and important facts concerning living beings. That organisms form classes and species is a consequence of this property, for no animal or plant would keep a constant form or constant habits if the repetition of an act already performed were not easier than

doing something new. The process resembles a path through the wilderness. The mere fact that the footprints of a previous wanderer can be recognized is sufficient to cause the later wanderer to keep in the same path, although he might possibly find another more convenient way if he made himself independent. The third man follows where his predecessors went, and the path becomes more and more distinct and a deviation from it more and more difficult and unlikely to occur. We may imagine the processes which brought about the origin of species and the maintenance of their relatively constant properties to have been of this same type.

A very important point in this general idea is the transmission of memory |

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from parents to offspring. The great riddle of heredity, which caused Darwin so much thinking without a corresponding result, may be brought somewhat nearer to a solution by the aid of this same concept of memory. A general view of the facts of generation and propagation shows us that the life of the offspring is nothing more nor less than the continuation of the life of the parents. Among simple cells propagation usually takes the form of a simple division; the nucleus first dividing itself into two equal parts, and the whole cell soon afterward separating into two. It is impossible to tell in this case which of the two cells is the parent and which is the offspring, since the two parts remain alike during the whole process of separation, and

each may claim with the same right either relation to the other.

Neither is it possible to say that the parent cell has died in giving rise to the two child-cells. The transition from the stage of a single cell to that of two separate cells is a quite continuous one, and there is no moment when the old cell disappears or ceases to exist. No part of the original cell can be recognized as the corpse of a being which has perished. The only possible way, then, of looking at this process is to say that the life of the original cell is continued under changed circumstances, namely, instead of *one* individual, *two* now exist. If the two cells remain united, as is usual in organisms consisting of a great number of cells, no doubt occurs to us

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as to the continuance of the life of the organism, even though all of its constituent cells divide until not one of the original cells remains. And the case is certainly not in the least changed if the two cells separate, either immediately after their formation or at a later time, into two independent individuals.

In this way life may continue, even if one of the child-cells perishes by some accident. For each of the new cells will divide again, and the greater the number of individual cells formed, the more certain the continuance of their common life. Death has here lost much of his power ; many individuals may perish, but the organism as such remains alive. Only when the very last of all the offspring perishes may death be regarded as the victor.

In following out this train of ideas we have already approached the question of immortality, for a famous biologist has called the fact just described Immortality. It is not my intention to adopt this view, for while the possibility of final death is much lessened by propagation and separation, or, in general, by the dissipation of life, it is not entirely excluded, but only made more improbable.

We can easily conceive of circumstances of such a generally deadly character that no individual can escape them. Then the divided organism will die just as does the single one. The question of the occurrence of such an event in the world's history cannot be answered conclusively, because it is connected with that other open ques-

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tion, Are all the living beings on the earth descended from one single cell, or has life come into being at different places and times? If we choose the first alternative, then all existing organisms are descendants or parts of the same organism, and this organism has enjoyed practical immortality up to the present. Even in the other case it is not necessary to assume that any one of the different parent organisms which have developed at various times has finished its career, since all of them may have survived in their offspring. Be that as it may, we can conceive of a universal catastrophe which would annihilate all life in all parts of the world, — which would destroy all the descendants of the first cell or first cells. And this conception

destroys the possibility of calling this sort of existence immortality, since the idea of immortality includes not only an unlimited possibility for the continuance of life, but also an absolute impossibility of destroying it utterly.

Although we meet with the idea of immortality in this line of thought, examination shows that we do not find real immortality here. And I feel sure that none of us expected to find it here, since it is not a material immortality but a spiritual one that we are seeking. Let us therefore return to our starting-point, the consideration of memory in its broadest sense, as set forth by Hering. We found that the existence of various species was explained by the general fact of memory as well as by heredity. And this idea

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is a still more far-reaching one, since memory explains also the functions of *mind*.

From the chaotic stream of ever-changing events which forms our life, those parts which are repeated in a similar way distinguish themselves by their mere repetition in accordance with the law of memory. They take place more easily and form prominent parts of the stream of events. Here we find the cause of reflex actions, instinctive actions, and finally of conscious memory. All the content of our experience relates to such repeated events only, for only repeated experience is experience in the proper sense of the word. Only by repetition do we gain knowledge, and only such series of facts as are repeated in a similar way become

so known to us that we can predict from one part of such a series the parts which are to follow. The mind is nothing more than a collection of such known series. If we experience a wholly new event, we invariably say that we do not understand it, and only after due repetition can it form a part of true experience.

Thus those parts of our general experience which recur often in the same way appear to be the most important parts, and indeed the only ones worth knowing. To explain the repetition of similar experiences we are accustomed to make the assumption that the repeated parts are in existence all the time, and that their appearance and disappearance is caused only by the variable direction of our attention. I

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may be looking at a flower-pot on my window-sill. I turn to my book and the flower-pot disappears so far as I am concerned. I turn my head again, and the flower-pot appears. What better supposition can I make than that it stood there all the while, since it depends only on my turning my head whether the flower-pot shall form a part of my consciousness or not?

In this way we get the idea of an existence which lasts longer than our sense-impression does. With visible, unchanging objects this supposition appears very natural and self-evident, although the arbitrary part of it has been recognized since the time of Berkeley. But in the same way we form the idea of persistence in the case of far more abstract concepts. The

chemist asserts that when he has burned coal to an invisible gas, carbonic acid, the vanished carbon has not really disappeared, but only been transformed into another form by its combination with the oxygen of the air. In this case the supposition is much more far-fetched, since all the appreciable properties of the carbon have disappeared with the exception of weight, and this persists only in the sense that the carbonic acid has a weight equal to the sum of the weights of the carbon and the oxygen before the change. But since it is possible to invert the process and change the carbonic acid into exactly as much carbon and oxygen as disappeared during its formation, we get a brief and intelligible description of these facts by con-

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sidering the elements of a compound substance as being hidden in it in some unrecognizable new form from which they can be recovered by proper means. This is the true sense of the law of the conservation of the elements.

Still less obvious is the persistence of the most general entity we know of in the physical world. I mean *Energy*. Energy in the form of mechanical work may be transformed into electricity, assuming a wholly new shape which has nothing in common with the former one except the proportionality of the quantities. And electricity may be transformed into light or heat or chemical energy, assuming the most diverse forms. But if we conclude such a series of transformations by changing the energy back into the form of me-

chanical work, we get exactly the amount we started from, provided that all losses on the way have been avoided or taken into account. We summarize this behavior by saying, Energy cannot be created or destroyed : energy is, therefore, an eternal thing.

There are a number of other things which are endowed with this same property of persistence. *Mass* is one of these. We know of nothing which can affect the quantity of a given mass. We may cool or warm it; we may bring the strongest chemical changes to bear on it; it may show a change in every other property; but its mass will not change. This fact is usually expressed by the words, *Matter* cannot be created or destroyed. But inasmuch as the term "matter" is indis-

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tinct in its meaning and exhibits many mystical components on closer investigation, we shall do better to avoid the word altogether and to limit our considerations to exactly defined magnitudes. If you say that *mass* cannot be created or destroyed, you state exactly what I have already said, — that no change whatever can cause a given mass to change.

We have then already two things or entities which seem to have a scientific right to be called eternal, or if you like, immortal. Science knows of still others, but as investigation of them would not tell us anything new, we may confine ourselves to these two. Now what does it mean to call a thing eternal?

For us it means that we do not know

of any circumstance by which the amount of mass or the amount of energy in a given system *has ever been changed*. We conclude from this that in future no circumstance will occur which will cause such a change. You see immediately how very shaky the ground is on which this best known scientific eternity rests. It is the most philistine idea that, because things have until now gone on in a certain way, therefore they will never go in any other way. And however closely we examine the case, we find that it always comes back to this same point. You may say, It is well known that everything in the world is regulated by cause and effect; that inviolable laws rule in the same way the path of the sun and the vibrations of the sin-

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gle atom. When I ask, How do you know this? and get the answer, This is the general result of experience, then we find ourselves at the starting-point again. For experience tells us that things *have* happened in accordance with this rule up to the present; but that they will happen in the same way throughout all the future is a mere assumption, which may have a greater or a smaller probability, but conveys no certainty whatever.

This result is not altered by the fact that certain predictions have proven to be very close to the facts of later experience. The motion of the heavenly bodies gives us an example of a probability which comes very near to being a certainty. We are able now to calculate eclipses to a fraction of

a second, provided they are to occur at a time not too remote. But all of these calculations depend on our knowledge of certain numerical values, especially the masses of the moving bodies, and our prediction becomes the more uncertain the farther off the eclipse is to be. Let us assume as an example that the time of an eclipse a hundred years off can be calculated with an error as small as a tenth of a second. For a thousand years the error will then be a second, and for a million years a thousand seconds, or more than half an hour. In fifty million years it becomes a whole day, and in eighteen thousand million years the error amounts to a whole year, provided the different laws on which the calculation is based are

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absolutely correct. Even this assumption is not at all a justifiable one, and so our true probability in this case shrinks to a much smaller value still. What will be the result finally if we extend our calculation to eternity? The answer is simply, An infinitely large probable error, or no probability at all.

Our conviction as to the eternity of mass is of exactly the same kind. Even if we assume that our experiences concerning mass will not change in general character in the future, it must still be remembered that our means of investigating possible changes in mass are limited in accuracy. We are able to determine the mass of a kilogram to a millionth of its value. To this degree of accuracy science

of our time has attained. If we then assume that no greater change than this millionth will occur in a given mass in a hundred years, we can easily calculate the time necessary for our kilogram to disappear completely. If some one became convinced, as a consequence, for example, of an otherwise developed theory of "matter," that such a change really does occur, we would be wholly unable to disprove his theory by reference to the indestructibility of mass. All we could show him is that the change cannot well be greater than the amount stated, and this with the proviso that masses behave in future as we know they have behaved in the past.

In connection with this we may consider another class of permanent

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beings, the chemical elements. The law above mentioned can be extended to the *conservation of the elements*, and it then states that a given quantity of any element cannot be altered by any change. If we start, for example, with one gram of iron, and change it through any series of compounds, we can, at any stage of the transformation, get our iron back unaltered in weight and with unaltered properties. These facts are described in a hypothetical way by assuming that the elements consist of very small atoms of definite shape and weight, and that chemical combination consists in the union of two or more different atoms by some bond, electrical, gravitational, or whatever it may be. Since atoms are assumed to keep their individuality in all their

combinations, it seems quite evident that elements should be recoverable without change from their combinations. The atoms have in this case only hypothetical existence, and this picture of the behavior of the chemical elements is therefore also a hypothetical one, but the law of the conservation of the elements is an empirical law and a very exact one too.

It is only in the last year or so that our hitherto unshaken conviction of the eternity of elements has suffered a severe blow. I refer to the discovery by Sir William Ramsay of the fact that the element radium can change into another element, helium, and something else that is not yet known. From the standpoint of a chemical "Weltanschauung" this is the most

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important discovery since the date of the discovery of oxygen, when our present ideas about the fundamental concepts of chemistry began to take form. It teaches unquestionably that there are some elements at least which are decidedly mortal. The investigations of Rutherford have brought to our attention a whole series of such elements, possessing varying lifetimes. Some of these come into existence only to leave this vale of tears after a few seconds, while others measure their lives in hours, days, years, and millions of years. We know indeed only very little about the other properties of these ephemeral beings, and they are characterized mainly by their average time of life, which can be measured by fairly accurate and convenient

methods. From these facts it is not a very long step to the conclusion that the other elements, which have as yet shown us no signs of mortality, hide this property only by virtue of the extreme slowness of their passing. This case shows very clearly how such possibilities as have been described as being beyond our limited means of observation may become realities if these means are sufficiently refined.

Energy occupies a somewhat surer position, inasmuch as we do not yet possess any hint of its mortality, or know of any exceptions to the law of the conservation of energy. This same wonderful substance, the element radium, has threatened energy in its conservatism, not with mortality, but the contrary, a creation out of nothing.

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If you place a piece of radium in a calorimeter you will observe that it gives out heat for days and weeks and months and years without interruption and at a constant rate. This seemed even more impossible than a permanent annihilation of energy, and the riddle remained unsolved until Ramsey made the discovery described above. The transmutation of radium into helium is the source of the developed heat. Just as steam yields heat when it changes into liquid water, so radium develops heat when it changes into helium. So the law of the conservation of energy is sustained by the facts, and from what I know of science I have the impression that energy will outlive everything else in the universe. I should

not feel justified in saying more than this.

But to resume our theme: all of our inferences about eternity are based on extrapolation from finite time and observations coupled with a certain error. It is a general rule that such extrapolations become the more uncertain the farther they go, and for infinite time or space the probable error oversteps all limits, and the contrary of our prediction may be as true as the prediction itself.

In science, therefore, no predictions of any kind which relate to infinite time or to eternity are possible. For a limited time predictions are possible, but never with absolute certainty. They are in every case subject to a certain probable error, which is dependent

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on the nature of the case, but increases invariably with the length of time over which the prediction is extended.

Science does not give us the only possibility of reaching a knowledge of the future. Religious beliefs, revelations, and other similar sources of assurance exist, and these may indeed convey to some minds a stronger conviction of the truth of a prediction than is afforded by science. But there is a great difference in the interpretation reached by various men guided by these different sources. Religious beliefs and similar sources are limited in the matter of the number of men giving them credence, and it is generally admitted that the conviction of their truth is dependent on a certain kind of interior personal expe-

rience. They offer no general proofs which must be accepted until error is found in them, as is the case with scientific proofs, and they can only be accepted by those who have passed through the inner experience and had the truth revealed to them by intuition.

If, then, the predictions of science lose somewhat in force with the individual, they gain much in the very generality of their acceptance. Of all the common treasures of mankind, science is by far the most general and the one most independent of differences in race, sex, and age. And while a religious belief invariably shows historically the greatest changes in content and intensity, science may seem to grow slower or faster at different

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periods, but the growth is constantly in the same direction. Science may therefore be considered as the surest and most lasting part of the spiritual treasure which man possesses. Such predictions as are indorsed by science are accepted as the most reliable ones by the intelligent majority of men.

Let us turn to another aspect of the eternity of energy and mass. If we take two different masses and combine them, the resulting mass will behave like the sum of the two single masses. This is a regular and immediate consequence of the conservation of mass, showing that physical addition does not change masses in amount. But though *the two masses retain their quantity*, they *lose their individuality*. If one of the masses was of one kilo-

gram and the other of two, the joint mass will be one of three kilograms. This mass may be divided again into two, one of one, and the other of two kilograms; but all our ways of measuring mass fail to tell whether the new kilogram is identically the old one, or is formed wholly or partially from the former two kilogram mass. This is a general fact of very great importance indeed, and it may be illustrated by another example. If you take two glasses of water and pour them together into one basin, the sum of the two quantities is obtained. You may then fill the two glasses again from the basin, but there is no means known in earth or heaven of finding out whether the water in each glass is now the same as before. Indeed, the

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question as to the identity or non-identity of the different portions of water is without meaning, since there is no means of singling out the individual parts of the water and identifying them.

The thought may occur to some one that if we could observe the individual atoms of water identification would be possible. Even this hope I must destroy. For the atomic theory starts from the assumption that the atoms of water are all alike in shape, weight, and other inherent properties, and that they vary only in such properties as may belong to one and the same atom ; velocity and direction of motion, for example. The same is assumed for every other pure substance. So any means of identification

is excluded by our definition. More than that, atoms are only hypothetical things, and even if they could be identified, the identification would be a hypothetical one, and not a real one.

And the same conclusion holds true for energy. So far there has been no assumption of an atomistic structure of energy, evidently because no scientific necessity has led to such an hypothesis. And so the identification of any special bit of energy appears still more hopeless than it did in the case of mass. By coming into contact with another quantity of like energy it is at once lost as completely as a drop is lost in the ocean. It retains its existence only in that it adds its share to the common quantity of energy, and no means is known by which this

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token of its continued existence can be destroyed.

This behavior is the more remarkable in that not the least doubt occurs to us about the identity of the bit of mass, or of water, or the bit of energy, so long as they are kept alone. Identity or individuality or personality, whichever you may wish to call it, is maintained under these circumstances. It is a strange thing indeed that by merely being associated with another thing of the same kind identity is lost. And still more strange is the fact that every being of this kind seems driven by an irresistible impulse to seek every occasion for losing its identity. Every known physical fact leads to the conclusion that diffusion, or a homogeneous distribution, of energy is the

general aim of all happenings. No change whatever seems to have occurred, and probably none ever will occur, resulting in a concentration greater than the corresponding dissipation of energy. A partial concentration may be brought about in a system, but only at the expense of a greater dissipation, and the sum total is always an increase in dissipation.

While we are as sure as science can make us about the general validity of this law as applied to the physical world, its application to human development may be doubted. It seems to me to hold good in this case also, if it is applied with proper caution. The difficulty lies in the circumstance that we have no exact objective means of measuring homogeneity and hetero-

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geneity in human affairs, and we can therefore not study any given system closely enough to draw a quantitative conclusion. It seems pretty certain that increase of culture tends to diminish the differences between men. It equalizes not only the general standard of living, but attenuates also even the natural differences of sex and age. From this point of view I should look upon the accumulation of enormous wealth in the hands of a single man as indicating an imperfect state of culture.

The property which has been described as an irresistible tendency toward diffusion may also be observed in certain cases in man. In conscious beings such natural tendencies are accompanied by a certain feeling which

we call will, and we are happy when we are allowed to act according to these tendencies or according to our will. Now, if we recall the happiest moments of our lives, they will be found in every case to be connected with a curious loss of personality. In the happiness of love this fact will be at once discovered. And if you are enjoying intensely a work of art, a symphony of Beethoven's, for example, you find yourself relieved of the burden of personality and carried away by the stream of music as a drop is carried by a wave. The same feeling comes with the grand impressions nature gives us. Even when I am sitting quietly sketching in the open there comes to me in a happy moment a sweet feeling of being united with the

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nature about me, which is distinctly characterized by complete forgetfulness of my poor self. We may conclude from this that individuality means limitations and unhappiness, or is at least closely connected with them.

Considering living beings more closely, we find generally greater individuality united with shorter duration. We have already seen that we must distinguish several grades of individuality. The life of any animal or plant is limited either by partition, when the single being changes into two, or by death, when it changes into none. Either change may properly be called a loss of individuality, for by the fact of division the concept of an individual is contradicted as strongly as by the fact of death.

But we may, as I have already explained, consider the sum of all the generations issuing from the first living being as a collective individual. Such a collective being is of course possessed of less individuality, but it has increased in duration. Looked at in this way, animate beings arrange themselves into a continuous series with inanimate matter, in which we found exactly the same reciprocal relation between individuality and duration : the least individualized things, like mass and energy, are the most durable ones, and *vice versa*. This is indeed quite general. The most individualized thing imaginable is the present moment : it is quite unique and will never return ; it is an absolute individuum. In our memory, when

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other moments have taken its place, it gradually loses its character and becomes more and more like other moments; this the more the farther back it goes in memory, and soon it cannot be distinguished from other moments; at last it is forgotten, and dies like an animal or plant.

Different moments have very different periods of life in our memory. Among the mass of unimportant and insipid moments, which die almost as soon as they are born, we find some whose influence is felt over days, months, years, even over the whole of our conscious lifetime. Their memory is not lost so long as the man lives to whom this moment came, and in this way the inherent brevity of the moment's existence is overcome and

it persists. It is, however, not eternal, since memory ends with life.

Immortality, in the immediate sense of the word, is of course not to be found in human beings. "All men are mortal" is indeed one of the most trivial empirical facts in our experience. So when we turn to human immortality, we can only ask, Is there in man anything more permanent than his body?

In this connection we must remember that the individuality of a living man is an incomplete and changing one. We are not in advanced age and in youth the same individual. Mind and body go through a series of changes during life, so that the same person at different ages is as different as different men are. What

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we call the individuality of a man consists only in the *continuity* of his changes, and the only sure means of identifying a man is to trace his existence continually through intermediate time. If a man survives his body, the continuity of his existence is broken by the event of death, and if he is possessed of immortality of some kind, it can be of only a partial nature.

Secondly, survival in some form or other does not necessarily mean immortality. To deserve the name, the surviving part must continue its existence for an unlimited time. Then two cases seem possible: either the surviving part changes during its further existence as continually as it did during its connection with the body,

or it remains constant. As all changes in individuality which occurred during the term of ordinary life went on in regular functional relation with the changes in the body, the inference is near that the body conditioned these changes, and that after its withdrawal the surviving part must remain constant. In an unchanging state like this such a being could remain for any length of time, for an infinite time, indeed, provided it could exist in a place where no changes occurred. But if this being is to remain in connection with changing beings like living men, it cannot remain unchanged, since connection and mutual influence mean change, and all the above-described difficulties of a changing existence extended over an unlimited time

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arise at once. And if, on the other hand, as is often assumed, the surviving being is changed into a transcendent state in which there is no question of time or space, then any kind of interaction between such a being and man in his ordinary life seems to be excluded, since all relations with us must assume the forms of time and space, all others being unintelligible to us.

The conclusion to be drawn from these considerations reads : Either the surviving being is immortal in the strict sense of the word, in which case it is not to be expected that it could communicate with men, and its existence would forever remain unknown to us. Or : nothing remains after death, in which case we should of

course have no experience of any surviving part of ourselves. To decide between these two alternatives is impossible, for they are indistinguishable and the same in effect.

We may then turn to the other seemingly less probable assumption, that there is something which survives, something which remains in connection with living men, and is therefore subject to change, and probably limited in existence. Does experience aid us here?

Every man leaves after his death certain things in the world changed by his influence. He may have built a house, or gained a fortune, or written a book, or begotten children. Even a child who dies soon after birth leaves an impression on his mother, which

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changes her. These relics are wholly personal or individual, and depend on the man who caused them ; only their effect is not alone determined by this, but also by the person or thing on which the effect is impressed. Such effects may last a longer or a shorter time, but they finally die out asymptotically into imperceptibility.

There is a very general desire in mankind to leave such impressions. From the scratched letters which a boy scribbles on the wall to the pyramids which have stood for scores of centuries we find the same purpose, — to extend the results of personal life beyond its local and temporal duration. And we are not fully satisfied with the mere existence of such objective souvenirs, but want other people to see

them and realize their meaning. So the boy does not scratch lines without significance, but the letters of his name or something else which interests him, and in the same way the Egyptian king did not forget to explain by letters and pictures his own connection with the huge building which will carry his name down through ages in the future.

This general desire for the propagation of one's personal influence is closely connected with the desire for the propagation of one's flesh and blood. Looked at from an objective and egotistic standpoint, it seems a rather nonsensical instinct. Why should I desire that some one else should enjoy the goods of this world that I have spent my whole life in

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gathering? But as a matter of fact it makes a fundamental difference even to the most hardened egotist whether this some one else is his own son or a stranger. He would not move a finger for the stranger, but he is ready to offer the greatest sacrifices for his son. It is true that there are some exceptions to this rule, but every one regards a man devoid of paternal instinct as a monster, an ethical cripple. And the fact that such a case is a deviation from the general rule is a sufficient reason against its continuance, since such a man would either have no children at all, or, if he had, he would neglect them and prevent their development.

Remembering that family and race are individuals too, of larger size and more diffused than a single man, to

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be sure, but still possessing very definite connections, we are aware at once that the instinct of self-preservation is here at work again. The effects of this instinct are blended with and doubled by the other instinct which makes us wish to leave records of our existence and our individuality, and by the operation of these factors a prolongation of every individual existence in a greater or less degree is secured.

Such a prolongation is not immortality in its strictest sense. For we observe that such influences, though they outlive the term of bodily life in the majority of cases, gradually cease to act, and die out asymptotically, just as any isolated physical existence does, by diffusing into the great mass of general existence and losing individ-

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uality and the possibility of being distinguished.

This is true primarily in the course of a sequence of generations. In order that a family may be continued, the son marries a wife from another family, and his son does the same. As a result the continuance of the family is secured, but at the cost of its individuality. By these necessary connections with other families, diffusion into the general mass of the world takes place, and the very means of continuing its existence results in this inevitable diffusion. And finally a family like mankind in general is subject to the possibility of ultimate destruction by some cosmic accident.

And other things left by an individual man at death take the same

course. Consider the best case, where we often use the word "immortal," that of a great poet or scientist. We say that Homer and Goethe, Aristotle and Darwin, are immortal, because their work is lasting, and will persist for scores of centuries, and their personal influence has proven independent of their bodily existence. Even the fact that death prevented them from doing more work of the kind they gave to us during their lives is not so important as it would seem at the first glance. When a man grows old his creative power, both bodily and mental, often dies, long before the ordinary functions of life have ceased. If a man lives his natural time out, he will probably do all the work that he is able to do well, and his death is then not

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a matter of importance. Only when death is premature do we feel that something has been lost, and only in such cases can we feel that death is cruel and unjust.

It is certainly a strange thing that physiology has done so little to explain the general facts of age and death. Judging by our present knowledge, there is no reason whatever why a living being should not live for any length of time. All the matter and energy used up can be restored by nutrition, and there seems to be no explanation for the fact that the organism ceases to transform nutrition into the materials necessary for its continuance, as it could do in the spring-time of its life. It would seem that either the store of some necessary factor becomes

exhausted, or that some pernicious factor is accumulated, by the mere fact of living, so that further life becomes at last impossible. To correct this influence a new being must begin life all over again, and therefore death and birth are to be considered the means by which life is continued as long as possible.

That some reason of this nature exists is made evident by the well-known experiments of Maupas on the propagation of protozoa. If they are kept in the environment most favorable for their existence, they will go on for a time growing and dividing in a quite regular manner. But after a series of asexual propagations by simple division they suddenly change their behavior. They couple and form germs

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and then a new series of asexual propagations begins. These facts can be explained in exactly the way already pointed out: either some poison is developed which can be thrown off only by sexual propagation, some necessary factor is secured by this means which is then slowly exhausted, and the lack of which forces the being finally to secure a new supply by a return to sexual propagation.

Considered from this standpoint death is not only not an evil, but it is a necessary factor in the existence of the race. And looking into my own mind with all the frankness and scientific objectiveness which I can apply to this most personal question, I find no horror connected with the idea of my own death. Of course it is objection-

able to suffer illness or pain, and there are beside still many things which I should like to do or to experience before I die. But this would be a loss to me only if I were afterward conscious of it and could regret it, and such possibilities seem to be out of the question. As to my friends and relations, they will feel my loss the less, the older I become. After I have lived out the span of my life, the bodily ending will seem a perfectly natural thing, and it will be more a feeling of relief than one of sorrow that will come in watching the end.

Quite independent of individual life or death, the work a man has done remains effective. How long it will remain effective is entirely dependent on the degree to which the work has

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suited the wants of the race. Work of no value to these wants will be wiped out as soon as possible, while useful work will be retained so long as it is seen to be useful. The examples I have given show how very long the influence of a great and useful worker may persist, but there is no doubt that by this very influence the individuality of his work disappears, however slowly. It becomes more and more a part of the general mental equipment of his clan, his nation, his race. It will then exist as long as these exist, no longer as a distinct idea or work of art, but as a common possession. Here again the general law of diffusion already met with is at work, and duration and individuality are linked as are reciprocal numbers: the one increases as the other diminishes.

This is the only lasting kind of life that I can discover in the realm of our experience. In this man is distinguished in a most decisive way from all of his fellow creatures, since in no lower race can a single individuum contribute his share, not only for the propagation, but also for the general development of the race. Animals seem generally to have no idea of death. I remember having seen a mouse step over the body of another, which had just been killed, in order to reach its food more easily. They live from hand to mouth, with no other foresight than a purely instinctive and unconscious one. In such animals as have by long domestication been influenced by mankind, some traces of conscious foresight appear. But while a dog shuns his

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master's whip, the effects of which he has experienced and can therefore foresee, he will not shun his master's gun, even though it has just killed another dog before his eyes. The human horror of death is a direct consequence of our greatly developed powers of foresight and memory, and this horror has been developed by the sight of painful and premature death. Our civilization is proceeding in such a way that preternatural death is more and more avoided, and we battle with the same eagerness against wild beasts and murder as against malady and misery. And our still existent horror of death we may regard as an inherited instinct, developed in the prehistoric times when death by force was common. All instincts develop slowly, and only be-

come fixed long after the time when they might begin to be useful, and in the same way all once acquired instincts persist long after the time when their necessity and even their usefulness has ceased. We may then think of a distant future time when this instinctive horror of death will have disappeared through the slow improvement of the human race.

There remains one last and most important question, What becomes of the foundation of all our *ethics* without the idea of a personal future life, in which vice shall be punished and virtue rewarded?

I do not hesitate to answer that I not only think ethics possible without this idea, but that I even think that this condition involves a very refined

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and exalted state of ethical development. Let us consider the general facts again.

There can be no doubt about nature being full of cruelty. All through the whole realm of organic beings we find in nearly every class of animals and plants some species which live at the expense of their fellow creatures. I mean parasitic organisms of every kind, whether they live in the interior of their hosts, whom they kill or make miserable, or whether they feed directly on other creatures. No one thinks of punishing a cat who tortures a poor mouse for no vital purpose whatever, and we find it perfectly natural that the larvæ of certain wasps should develop in the interior of caterpillars, slowly devouring their hosts from

within. It is only man who tries to change this general way of nature's and to diminish as far as possible cruelty and injustice to his fellow men and his fellow creatures. And from the strong desire that this black stain should be removed as fully as possible from humanity, the idea developed that there must be beyond our bodily life a possibility of compensating for the evil which is done and for that which is suffered during life without due punishment or reward as suggested by our sense of justice.

But reward and punishment take on a wholly different aspect when we regard mankind as one collective being. Then the single individual is comparable to a cell in a highly developed organism. Destruction of his fellow cells

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would be a nuisance and a menace to the whole organism, and therefore any cell which destroyed its neighbors would be either removed from the organism or else encysted and kept from doing further damage. And on the other hand such cells as fulfilled useful purposes would be nourished and protected.

The very necessity for overcoming such dangerous actions on the part of the cells means a decrease in the efficiency of the organism, since the work necessary for the purpose could be better used for the immediate benefit of the organism itself. The best thing would then be to avoid beforehand the formation of such bad cells, and an organism possessed of appropriate means of doing this would have a great advantage.

The application of these considerations to the human collective organism is obvious. Punishment means in every case a loss, and the aim of increasing culture is not to make punishment more effective, but to make it unnecessary. The more each individual is filled with the consciousness that he belongs to the great collective organism of humanity, the less will he be able to separate his own aims and interests from those of humanity. A reconciliation between duty to the race and personal happiness is the result, as well as an unmistakable standard by which to judge our own actions and those of our fellow men.

Self-sacrifice has been considered in all ages and by all religions as the very highest perfection of ethical develop-

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ment. At the same time every man who has thought a little deeper has been aware that the self-sacrifice must have a meaning, that it must result in some effect which could not be attained by other means. Otherwise the self-sacrifice would not be a gain, but rather a loss, to humanity. But we consider self-sacrifice for the sake of humanity as justified, and this corresponds with our general feeling. We admire a man who throws himself into a fire or a torrent to save a child from death ; it should mean even more to us when a physician goes into the midst of a raging pestilence conscious of the peril awaiting him. But we do not esteem a man the more for risking his life to save his money from a burning house.

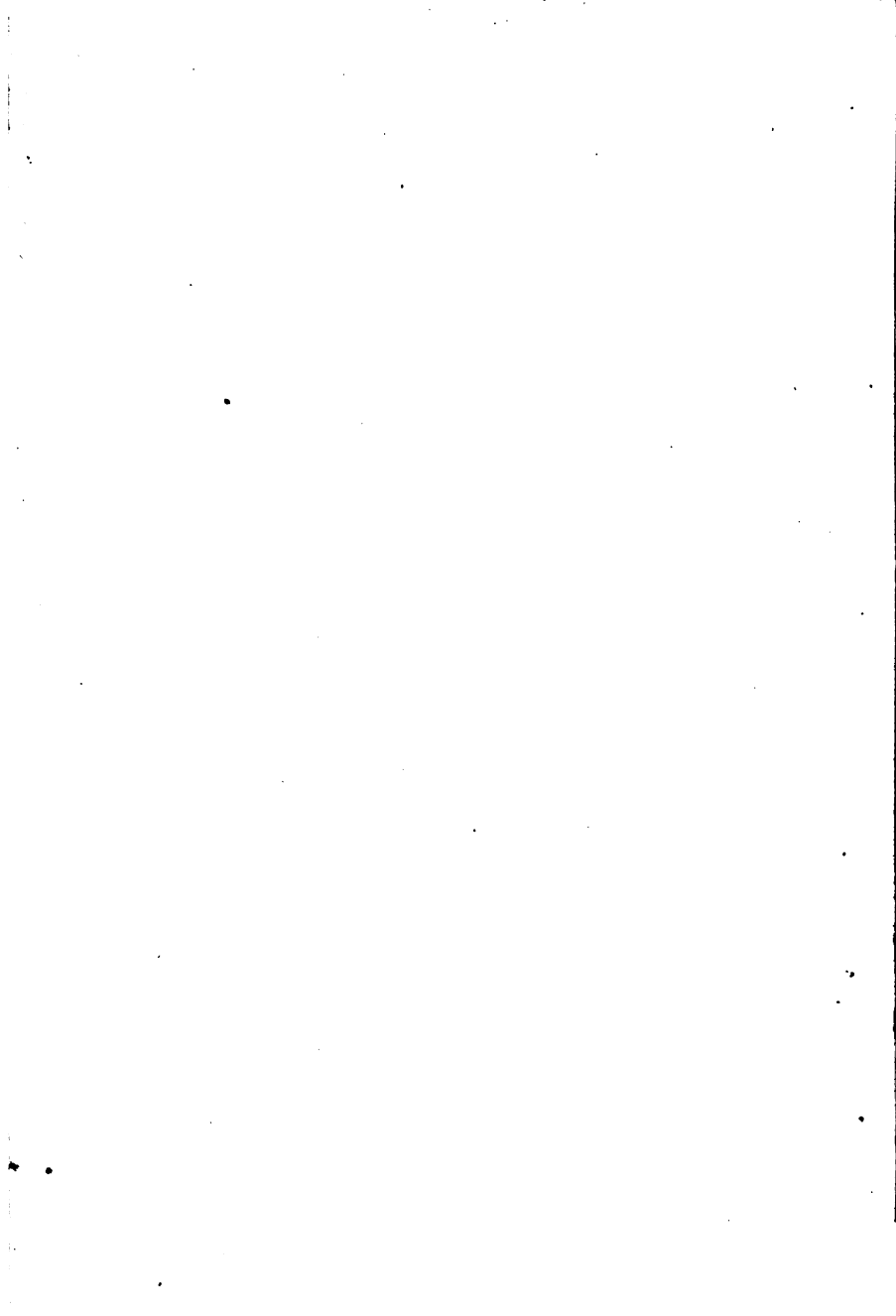
In fact, we find the interests of hu-

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manity in the very centre of our ethical consciousness. To frighten people into ethical action by threatening them with eternal punishment is a poor and inefficacious way of influencing them. The natural way is to develop a consciousness of the all-pervading relation between the several individuals which make up humanity, and this to such a degree that the corresponding actions become not only a duty but a habit, and at last an instinct, directing all our doings quite spontaneously for the interest of humanity. And every mental and moral advance which we make for ourselves by our constant efforts at self-education will be at the same time a gain for humanity, since it will be transmitted to our children, our friends, and our pupils, and will

be to them easier than it was to us, according to the general law of memory. Beside the fact of inherited taint there exists the fact of inherited perfection, and every advance which we, by the sweat of our brows, may succeed in making towards our own perfection, is so much gain for our children and our children's children forever. I must confess that I can think of no grander perspective of immortality than this.

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